I claim:

1. A mass analyzer comprising an electron source, the electron source including:
an electron filament coupled to an electrical supply, the electron filament including a conductive wire or conductive ribbon, and the electron filament configured to generate electrons when heated;
a plurality of nanofilaments disposed on the surface of the electron filament; and
a filament body for positioning the electron filament relative to a mass filter.

2. The mass analyzer of claim 1, wherein the electron filament is configured to generate electrons when heated in an electric field of less then 70 volts per centimeter.

3. The mass analyzer of claim 1, wherein the electron filament is configured to generate electrons when heated in an electric field of less then 50 volts per centimeter.

4. The mass analyzer of claim 1, wherein the electron filament is configured to generate electrons while a background pressure in the source is greater than 1.0×10^{-4} Torr.

5. The mass analyzer of claim 1, wherein the electron filament is configured to generate electrons while a background pressure in the source is greater than 1.0×10^{-5} Torr.

6. A mass analyzer comprising an electron source, the electron source including:
an electron filament coupled to an electrical supply configured to pass a current through the electron filament;
a plurality of nanofilaments disposed on the surface of the electron filament;
a filament body for positioning the electron filament relative to a mass filter; and
means for directing electrons generated using the electron filament.

7. The mass analyzer of claim 6, wherein the means for directing electrons is a magnetic field.

8. The mass analyzer of claim 6, wherein the electron source is configured such that the directed electrons are accelerated to an energy of approximately 70 electron volts.

9. The mass analyzer of claim 6, wherein the nanofilaments include carbon nanotubes.

10. The mass analyzer of claim 6, wherein the nanofilaments include boron.

11. The mass analyze of claim 6, wherein the wherein the electron source is configured to generate electrons for electron capture ionization.

12. The mass analyzer of claim 6, wherein the electron source is configured to generate electrons for electron impact ionization.

13. The mass analyzer of claim 6, wherein the electron source is configured to generate electrons for chemical ionization.

14. The mass analyzer of claim 6, wherein the electron source is configured to generate electrons for ion fragmentation.

15. The mass analyzer of claim 6, wherein the electron filament is a ribbon or wire.

16. The mass analyzer of claim 6, further including a mass filter.

17. The mass analyzer of claim 6, further including a sample source.

18. A filament assembly comprising:

an electron filament coupled to an electrical supply configured to provide a current through the electron filament and to hold the electron filament at a potential relative to part of an electron source;

a plurality of nanofilaments disposed on the surface of the electron filament; and

means for positioning the electron filament.

19. The filament assembly of claim 18, wherein the electron filament is a wire or a ribbon.

20. The filament assembly of claim 18, wherein the potential is approximately 70 Volts..

21. An analysis system comprising:

an electron filament coupled to an electrical supply configured to pass a current through the electron filament and to hold the electron filament at a potential of approximately 70 Volts relative to an other part of the analysis system, the electron filament including a conductive wire or conductive ribbon, the electron filament configured to generate electrons when heated;

a plurality of nanofilaments disposed on the surface of the electron filament;

a filament body for positioning the electron filament relative to the other part of the analysis system;

means for directing electrons generated using the electron filament;

a mass filter configured to filter ions generated using the generated electrons; and

an ion detector configured to detect the filtered ions.

22. The analysis system of claim 21, further including a chromatograph configured to introduce a sample to the mass filter.

23. The analysis system of claim 21, further including a second mass filter configured to introduce a sample to the mass filter configured to filter ions generated using the generated electrons.

24. A method of analyzing a sample comprising:

generating electrons with energy of approximately 70eV, using an electron filament coupled to an electrical supply configured to pass a current through the electron filament and to hold the electron filament at an approximate potential, the electron filament including a conductive wire or conductive ribbon, the electron filament further including a plurality of nanofilaments disposed on the surface of the electron filament;

causing the generated electrons to contact the sample;

ionizing the sample using the generated electrons, to produce ions;

separating the produced ions; and

detecting the separated ions.

25. The method of claim 24, wherein the separation ions are separated in time.

26. The method of claim 24, wherein the produced ions are produced using chemical ionization.

27. The method of claim 24, further including maintaining a background pressure greater than 1 x 10^{-5} Torr.

28. A method of analyzing a sample comprising:

generating electrons using an electron filament coupled to an electrical supply configured to pass a current through the electron filament and to hold the electron filament at an approximate potential, the electron filament including a conductive wire or conductive ribbon, the electron filament further including a plurality of nanofilaments disposed on the surface of the electron filament;

causing the generated electrons to contact an ion;

fragmenting the ion using the generated electrons, to produce an ion fragment;

filtering the produced ion fragment; and

detecting the filtered ion fragment.

29. The method of claim 28, further including generating the ion using a mass filter.

30. The method of claim 28, wherein the generated electrons are caused to contact the ion in a region with a background pressure of greater then 1 x 10^{-4} Torr.

31. A filament assembly comprising:

an electron filament configured to be coupled to an electrical supply for providing a current through the electron filament and for holding the electron filament at a potential relative to part of an electron source; and

a plurality of nanoparticles disposed within the electron filament.

32. The filament assembly of claim 31, wherein the nanoparticles are configured to modify grain boundaries within the electron filament.

33. The filament assembly of claim 31, wherein the nanoparticles include polyhederal oligomeric silsesquioxane.

34. The filament assembly of claim 31, wherein the nanoparticles include a silicon compound of the chemical composition shown in FIG. 7.

35. The filament assembly of claim 31, wherein the nanoparticles include a silicon compound of the chemical structure shown in FIG. 7.

36. The filament assembly of claim 31, further including means for positioning the electron filament relative to a mass filter.

37. The filament assembly of claim 31, wherein the potential relative to part of an electron source is approximately 70 Volts.

38. The filament assembly of claim 31, further including means for positioning the electron filament relative to an electron gun.